

What is claimed is:

1. A premixed air-fuel mixture supply device combined with a combustor liner included in a combustor for a gas turbine or an aircraft engine, said premixed air-fuel mixture supply device comprising:

a pilot fuel injection unit having an inner wall connected to a head part of the combustor liner; and

a prevaporizing, premixing main fuel injection unit having an outer wall connected to the head part of the combustor liner and surrounding the inner wall;

wherein the inner wall and the outer wall define a combustion air passage, an intermediate wall is disposed in the combustion air passage so as to divide an upstream part of the combustion air passage into an inner combustion air passage surrounding the inner wall, and an outer combustion air passage surrounding the intermediate wall, fuel injecting holes are formed in the intermediate wall to inject fuel radially outward so as to cross air currents flowing through the combustion air passage into the outer combustion air passage of the combustion air passage, and an atomization lip is formed in a tail part of the intermediate wall to promoting the atomization of fuel adhering to the tail part at a downstream edge of the intermediate wall.

2. A premixed air-fuel mixture supply device combined with a combustor liner included in a combustor for a gas turbine or an aircraft engine, said premixed air-fuel mixture supply device comprising:

a pilot fuel injection unit having an inner wall connected to a head part of the combustor liner; and

a prevaporizing, premixing main fuel injection unit having an outer wall connected to the head part of the combustor liner and surrounding the inner wall;

wherein the inner wall and the outer wall define a combustion air passage, an intermediate wall is disposed in the combustion air passage so as to divide an

upstream part of the combustion air passage into an inner combustion air passage surrounding the inner wall, and an outer combustion air passage surrounding the intermediate wall, fuel injecting holes are formed in the intermediate wall to inject fuel radially inward so as to cross air currents flowing through the combustion air passage into the inner combustion air passage of the combustion air passage, and an atomization lip is formed in a tail part of the intermediate wall to promote the atomization of fuel adhering to the tail part at a downstream edge of the intermediate wall.

3. The premixed air-fuel mixture supply device according to claim 1, wherein a sectional area of the inner combustion air passage is 10% or below of a sectional area of the combustion air passage of the prevaporizing, premixing main fuel injection unit.

4. The premixed air-fuel mixture supply device according to claim 2, wherein a sectional area of the outer combustion air passage is 10% or below of a sectional area of the combustion air passage of the prevaporizing, premixing main fuel injection unit.

5. The premixed air-fuel mixture supply device according to claim 1 or 3, wherein, a swirling device is disposed in the inner combustion air passage to swirl combustion air flowing through the inner combustion air passage in the same direction as combustion air flowing through the outer combustion air passage.

6. The premixed air-fuel mixture supply device according to claim 2 or 4, wherein a swirling device is disposed in the outer combustion air passage to swirl combustion air flowing through the outer combustion air passage in the same direction as combustion air flowing through the inner combustion air passage.

7. The premixed air-fuel mixture supply device according to any one of claims 1, 3 and 5, wherein a swirling device is disposed in the inner combustion air

passage to swirl combustion air flowing through the inner combustion air passage in a direction opposite a direction in which combustion air flowing through the outer combustion air passage swirls.

8. The premixed air-fuel mixture supply device according to any one of claims 2, 4 and 6, wherein a swirling device is disposed in the outer combustion air passage to swirl combustion air flowing through the outer combustion air passage in a direction opposite a direction in which combustion air flowing through the inner combustion air passage swirls.

9. The premixed air-fuel mixture supply device according to any one of claims 1 to 8, wherein an extremity of the atomization lip is formed in a sharp edge.

10. The premixed air-fuel mixture supply device according to any one of claims 1 to 9, wherein an extremity of the atomization lip is cut perpendicularly or substantially perpendicularly to a flowing direction of combustion air.